

What is claimed is:

1. An aorta cross clamp assembly, comprising:

a clamp having first and second jaws that are movable toward and away from each other;

a retainer operatively connected to the first and second jaws and movable between locked and unlocked positions, the retainer when in the locked position permitting the jaws to move toward each other but preventing the jaws from moving away from each other, and when in the unlocked position permitting the jaws to move away from each other;

an actuator having first and second arms that are movable toward and away from each other, the arms being selectively and operatively engageable with and disengageable from the first and second jaws; and

a third arm selectively engageable with and disengageable from the retainer, the third arm being movable between a first position where the third arm is disposed adjacent the retainer when the retainer is in the locked position and a second position where the third arm engages the retainer and displaces it to the unlocked position.

2. The assembly of claim 1, wherein:

the first jaw is connected to a first handle;

the second jaw is connected to a second handle;

a hinge pin connects the handles for pivotal movement;

the end of each handle remote from the hinge is configured to define a slotted

6 opening; and
7 the handles, when in the jaw-locked position, have a space therebetween.

1 3. The assembly of claim 2, wherein the retainer includes:
2 a ratchet bar that is connected at one end to a selected one of the handles and
3 which includes a plurality of teeth on a surface facing the handles; and
4 a plurality of teeth on the other of the handles, the teeth on the handle adapted
5 to engage the teeth on the ratchet bar.

1 4. The assembly of claim 3, wherein:
2 the ratchet bar is curved to a radius from the hinge pin that approximates the
3 radius of the ends of the handles from the hinge pin; and
4 the ratchet bar is spring-mounted to the selected handle with a bias toward
5 contact with the end of the handle.

1 5. The assembly of claim 3, wherein the actuator includes:
2 a first arm connected to the first handle, the first handle having a finger loop;
3 a second arm connected to the second handle, the second handle having a
4 finger loop;
5 the first and second handles being connected to each other by a hinge;
6 a third arm connected to a third handle, the third handle having a finger loop, the
7 third arm having a finger disposed at right angles to the third arm, the finger being

8 engageable with the ratchet bar.

1 6. The assembly of claim 5, wherein:

2 a sleeve is connected to the hinge, the third arm extending through the sleeve;

3 a stop is mounted on the third arm; and

4 a spring is disposed between the sleeve and the stop to bias the third arm to a
5 finger-extended position.

1 7. The assembly of claim 5, wherein the ends of the first and second arms
2 include space-apart discs that are connected by a pin, the pin adapted to fit within one
3 of the slotted openings.

1 8. The assembly of claim 1,
2 the first jaw is connected to a first handle;
3 the second jaw is connected to a second handle;
4 a hinge pin connects the handles for pivotal movement; and
5 a spring is disposed between the handles and biases the handles apart.

1 9. The assembly of claim 8, wherein the retainer includes:
2 a first ratchet bar that is connected at one end to a selected one of the handles,
3 the first ratchet bar including a plurality of teeth;
4 a second ratchet bar that is connected at one end to the other of the handles,

the second ratchet bar including a plurality of teeth; and
the ratchet bars being disposed parallel to each other with the teeth on the
respective ratchet bars facing each other and engaging each other.

10. The assembly of claim 9, further comprising:

a first spacer bar disposed parallel to the first ratchet bar, the first spacer bar
being connected to the end of the selected handle, the first spacer bar and the first
ratchet bar being spaced apart a distance sufficient for the second ratchet bar to be
received therebetween; and

a second spacer bar disposed parallel to the second ratchet bar, the second
spacer bar being connected to the end of the handle to which the second ratchet bar is
connected, the second spacer bar and the second ratchet bar being spaced apart a
distance sufficient for the first ratchet bar to be received therebetween.

11. The assembly of claim 10, wherein the actuator includes:

a first arm connected to the first handle, the first handle having a finger loop;
a second arm connected to the second handle, the second handle having a
finger loop;

the first and second handles being connected to each other by a hinge;

a third arm connected to a third handle, the third handle having a finger loop, the
third arm being ogee-shaped and having an axially extending lower portion, the axially

8 extending lower portion being engageable with a selected one of the first or second
9 spacer bars.

1 12. The assembly of claim 11, wherein:

2 a formation is connected to the hinge, the formation having a pair of spaced tabs
3 through which the third arm extends;

4 a second hinge pin extends through the third arm and the tabs, the second hinge
5 pin being disposed at right angles to the first hinge pin; and

6 a spring is disposed between the formation and the third arm to bias the third
7 arm to position where the axially extending position is disposed adjacent a selected
8 one of the first or second spacer bars.

1 13. The assembly of claim 11, wherein:

2 the ends of the first and second arms include shells adapted to receive the first
3 and second handles of the clamp;

4 the shells being movable toward each other upon movement of the first and
5 second handles of the actuator so as to move the first and second handles of the clamp
6 toward each other; and

7 the shells defining a space therebetween when the shells are closed, the space
8 being of a size and shape to permit the axially extending lower portion of the third arm
9 to pass therebetween.

1 14. An aorta cross clamp assembly, comprising:

2 a clamp having first and second jaws that are movable toward and away from
3 each other;

4 an elongate housing having first and second ends, the clamp being connected to
5 the first end;

6 an elongate actuator disposed within the housing and operatively connected to
7 the jaws such that axial movement of the actuator within the housing causes the jaws to
8 move toward or away from each other;

9 a retainer disposed within the housing, the retainer having two modes of
10 operation, the retainer in the first mode permitting the actuator to move within the
11 housing such that the jaws are moved toward each other but not away from each other,
12 and the retainer in the second mode permitting the actuator to be moved within the
13 housing such that the jaws are moved away from each other;

14 a handle connected to the second end of the housing; and

15 a stem connected to the actuator, the stem projecting outwardly of the handle,
16 the stem permitting the user to operate the actuator in either the first or second modes
17 of operation permitted by the retainer.

1 15. The assembly of claim 14, wherein the first jaw is fixed and the second
2 jaw is movable toward or away from the first jaw.

1 16. The assembly of claim 15, wherein the clamp includes:
2 a base having a bore therethrough, the first jaw being connected to the base;
3 a slot in the first jaw adjacent the connection with the base, the second jaw being
4 disposed within the slot; and
5 a hinge pin extending through the slot and the second jaw to support the second
6 jaw for pivotal movement within the slot.

1 17. The assembly of claim 16, wherein the retainer includes:
2 a screw disposed within the bore, the screw having first and second ends;
3 a nut connected to the base, the screw passing through the nut, the connection
4 between the nut and the screw being such that the screw can move toward the second
5 jaw without rotating but the screw can move away from the second jaw only by being
6 rotated;
7 a slot in the second jaw;
8 a link rotatably connected to the first end of the screw and connected to the
9 second jaw by a pin passing through the link and the slot; and
10 a drive connector connected to the second end of the screw, the actuator being
11 connected to the connector in driving relationship.

1 18. The assembly of claim 15, wherein the housing is flexible and the actuator
2 is a cable.

1 19. The assembly of claim 15, wherein the second end of the housing
2 includes a fitting to which the handle is secured, the handle has a pair of finger loops,
3 and the stem has a knob.